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Au pays de l'or noir. Para, Amazonas, Matto Grosso. Par Paul Walle. 244 pp., 60 Views from Photographs and 3 Maps. E. Guilmoto, Paris. No date. Frs. 4.50.

An interesting and complete account of the rubber industry in the valley of the Amazon, including the areas of production, the types of rubber forming trees, the methods of gathering and treating the gum and the statistics of rubber trade in the region.

The earlier part of the volume includes a description of the geography of Pará, a glowing account of the climate of the Amazon region, grazing in the Amazon country and an account of a voyage up the Amazon, including descriptions of the cities and towns which may be seen from the steamer. The remaining seven chapters are devoted entirely to the rubber industry.

One is struck by the author's emphasis of the healthfulness of the Amazonian climate, which seems to be borne out by the comparative statistics of mortality. These show that the death rate here is 28.75 per thousand, which is less than half that at Bombay and slightly less than that at St. Petersburg.

Grazing in the natural grassy areas and in fenced farms is developing rapidly and herds of cattle, zebus and horses are numerous and increasing. In some cases modern systems of breeding are being introduced and the milk-producing ability of the cattle is being rapidly increased. The industry seems to thrive in spite of the alligators and jaguars, and the cattle diseases which at times produce enormous destruction.

In the chapters on rubber production, the character and value of the different rubber-producing trees are considered in detail and the palm given to the "King of all rubber trees," the *Hevea brasiliensis*. Brazil to-day produces more than 65 per cent. of the rubber of the world, and vast areas of rubber culture are as yet unexploited. Particularly interesting is the account of the development of Acre which, only a few years ago, was in the public eye because of the attempts to make this region an independent country. Brazil secured this country by treaty and by paying an indemnity of £2,000,000 sterling. Already this region has been of great value to Brazil and has more than paid for itself from the profits of its rubber.

The author devotes one chapter to a comparison of the value of Amazonian rubber with Asiatic rubber and shows that the former is generally considered by the rubber brokers as more elastic and strong. This is largely due, it is supposed, to differences in the method of rough curing of the rubber, and the author believes that the difference in production in Brazil's favor is to increase as the years go on.

The volume is well written and well illustrated and gives an excellent account of the rubber industry in the Amazon country up to the end of the year 1908. It forms an excellent source of information and is a distinct, authoritative addition to our rational volumes on commercial geography. R. E. DODGE.

The Geology and Scenery of the Grampians and the Valley of Strathmore. By Peter Macnair. Two Vols. Vol. I, xiv and 195 pp.; Vol. II, xii and 199 pp.; Bibliography, Index and many Photographs, Diagrams and Maps. James MacLehose & Sons, Glasgow, 1908.

The geological history of the Grampian Hills of Scotland and the Midland Valley or "Lowlands" south of them, as set forth in this two-volume work, may

be summarized as follows: A series of Pre-Cambrian (?) rocks, mostly marine sediments, was raised above the sea and folded into several great "fans" whose axes trended northeast and southwest. Marine erosion reduced this mountain system to a submarine plain, upon which red marine sediments, the Old Red Sandstone system, were deposited. The whole was then apparently raised above the sea. One of the great denuded fan-folds, with the sandstones lying upon its bevelled surface, was dropped down between two fault planes, and now underlies the broad Midland Valley. In the district of the Grampians, north of the valley, southeast flowing streams developed on the southeast sloping surface of the Old Red Sandstones, and finally cut into the underlying Pre-Cambrian (?) rocks, whereupon northeast-southwest tributary streams were developed along soft rock belts trending with the strike of the fan folds. Ultimately sub-aërial erosion removed the sandstones from most of the highland area, exposing the old surface of marine denudation, now much dissected by the transverse and longitudinal streams. Glaciation deepened some of the stream valleys to form lake basins, and filled others with glacial deposits. Slight changes in the position of the land with respect to sea level, and the normal work of post-glacial river erosion have given the finishing touches to the landscape.

The reader will unfortunately find much in the work which merits unfavorable criticism. The evidence presented in the text does not convince one that the author's interpretation of structure is correct. The verity of the marine planation of the ancient rocks rests on the assertion that the conglomerates at the base of the Old Red Sandstone series point unmistakably to the existence of a sea margin creeping slowly inward upon the gradually sinking land. The possibility of a relatively recent date and sub-aërial origin for the base-levelled plain is not considered by the author; and the highly improbable interpretation of it as a resurrected marine plain of ancient date is not supported by any evidence. The marine origin of the Old Red Sandstone series is defended, in spite of its included remains of land plants and fresh-water fishes; and the arguments by which the author supports the marine theory take no account of the literature on continental deposition which has appeared in the last decade.

The work is full of obscurities and contradictions. The volcanic rocks occurring in the Old Red Sandstone are described on page 5 of Volume II as having been poured out on the sea-floor and interbedded with the sandstones; on page 159 of the same volume we read that after the sandstones had been deposited, uplifted, and later dropped down between two faults, the sunken area became the site of igneous action which poured the lavas out on the surface and intruded sills and bosses into the strata. It would appear that the same volcanic rocks are referred to in each case. The diagram on page 160, Volume II, to illustrate one stage in the geological history of the region, shows a base-levelled surface which is not mentioned in any place in the two volumes.

The physiography and scenery receive less attention than the structure and stratigraphy, and the treatment of the former two topics is perhaps even less satisfactory than that of the latter. Much space is devoted to lists of altitudes of numerous peaks, to the location of things better shown on maps, and even to the enumeration of the tributaries entering the two sides of rivers. Important matters, such as the present appearance of the dissected base-level plain, the development of the drainage features, and the glaciation of the highland valleys, receive treatment which is quite inadequate, and in many places even crude.

The descriptions of the base-level surface are not supported by the illustrations, which suggest an upland of marked relief. Lake basins are accepted as the measure of glacial erosion, notwithstanding that the error of this measure has often been pointed out. The importance of ice action in modifying the forms of the valleys and in producing much of the ruggedness of mountain form, is not recognized. It is asserted that the Highland valleys were formerly filled up with boulder clay, which was later removed by local glaciers and post-glacial denudation; yet no evidence is given to support the assertion of so improbable a history.

The work is abundantly illustrated by numerous beautifully colored maps and excellent engravings. Occasionally the confusion which characterizes much of the text is apparent in the maps. On the geological map at the end of Volume I, the axis of the great central fan or "Fächer" is located near the northern boundary fault of the Midland Valley, and labelled "Supposed axis of Marginal Fächer." The axis of the "Ben Lawers Fächer" is labelled "Axis of Great Central Fächer." As a result, the descriptions on pages 181-183, with their reference to the map, are most confusing.

The work is altogether a most disappointing publication. The reader finishes his perusal of the text with the conviction that it does not treat in a capable and convincing manner the important subject with which it deals.

D. W. JOHNSON.

The California Earthquake of April 18, 1906. Report of the State Earthquake Investigation Commission. In Two Parts and Atlas. By Andrew C. Lawson and Others. Part I: xviii and 254 pp.; Part II: pp. 255-451, Maps, Seismograms, and Illustrations. Carnegie Institution of Washington, Washington, 1908. Price (2 Parts and Atlas) \$17.

The Atlas is noticed in the *Bulletin*, Vol. 41, p. 469. The Report has been everywhere recognized not only as an able and complete account of the California earthquake of 1906, but also as a very important addition to the literature of seismology. Although the Commission which made this investigation and report was appointed by the Governor of California, the State government provided no funds for the conduct of the work. The resulting embarrassment was finally relieved by a subvention from the Carnegie Institution.

Wissenschaftliche Ergebnisse der Expedition Filchner nach China und Tibet, 1903-1905. X. Band—I. Tiel. 1 Abschnitt: Zoologische Sammlungen. C. Attems, M. Burr, A. Forel and Others; 2 Abschnitt. Botanische Sammlungen. Prof. Dr. Diels. xii and 288 pp., Map, Illustrations, and Index. Ernst Siegfried Mittler und Sohn, Berlin, 1908.

The expedition of Lieut. Wilhelm Filchner to China and Tibet was remarkably fruitful in scientific results and was recognized by the German Geographical Congress with a special vote of thanks. Means were provided for the full presentation and discussion of these results and the volumes are now appearing, in sumptuous form, from the press of Mittler & Son. Eighteen specialists of Germany, Austria, Switzerland and England report, in the present volume, on the zoological collections. The botanical results, chiefly the work of the explorer's wife, are discussed by Dr. Diels in 28 pp.